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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/602,947	06/24/2003	Sang Un Choi	CU-3268 RJS	1030
26530	7590	09/22/2004	EXAMINER	
NGUYEN, THANH NHAN P				
ART UNIT		PAPER NUMBER		
		2871		

DATE MAILED: 09/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/602,947	CHOI ET AL.	
	Examiner (Nancy) Thanh-Nhan P Nguyen	Art Unit 2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on _____.
 2a) This action is **FINAL**. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-5 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
 5) Claim(s) ____ is/are allowed.
 6) Claim(s) 1-5 is/are rejected.
 7) Claim(s) 3 is/are objected to.
 8) Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on 24 June 2003 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
 Paper No(s)/Mail Date _____.
 4) Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____.
 5) Notice of Informal Patent Application (PTO-152)
 6) Other: _____.

DETAILED ACTION

Specification

The disclosure is objected to because of the following informalities: on page 4, line 24 presently read as "YN modes" which the examiner suggests it should be rewritten to "TN modes"; on page 10, line 5, 12, 20, 22, and on page 11, line 4 presently read as "pixel electrode 3" which the examiner suggests it should be rewritten to "pixel electrode 3a"; also, on page 10, line 5 presently read as "the pixel electrode 3 of the upper substrate 1" which the examiner suggests it should be rewritten to "the pixel electrode 3a of the lower substrate".

Appropriate correction is required.

Claim Objections

Claim 3 is objected to because the word "cramp" is not quite clear for describing a shape in accordance with the definition on dictionary.com below:

cramp:

1. A sudden, involuntary, spasmodic muscular contraction causing severe pain, often occurring in the leg or shoulder as the result of strain or chill.
2. A frame with an adjustable part to hold pieces together; a clamp.
3. A compressing or restraining force, influence, or thing.
4. A confined position or part.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada U.S. Patent Application Publication No. 2002/0159012 in view of Yano et al J.P. Patent No. JP02002090531.

Referring to claim 1, Yamada discloses a liquid crystal panel comprising lower and upper substrates, 104 and 102 respectively, oppositely arranged at a predetermined distance; a liquid crystal layer interposed between the upper and lower substrates and including liquid crystal molecules having a negative dielectric constant anisotropy; a pixel electrode 113 formed on an inner surface of the lower substrate; a color resin layer 124 formed on an inner surface of the upper substrate and having a "V"-shaped valley 124a; an opposite electrode 112 on the color resin layer including the "V"-shaped valley; vertical alignment layers 140 interposed between the pixel electrode and the liquid crystal layer and between the opposite electrode and the liquid crystal layer, respectively, [see page 2, Detailed Description, paragraph 0021, and figures 5, 7].

Yamada lacks of showing a liquid crystal panel with polarizing plates attached to outer surfaces of the lower and upper substrates, respectively, with their polarizing axes crossing each other.

Yano et al teaches a liquid crystal panel with polarizing plates attached to outer surfaces of the lower and upper substrates, respectively, with their polarizing axes

crossing each other for the benefit of having excellent contrast in a wide viewing angle and excellent display quality, [see Abstract].

Therefore, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have the liquid crystal panel consists of the vertical alignment mode liquid crystal cell on the both sides of which the polarizing plates are arranged in the crossed Nicols with the transparent layers on the cell sides for the benefit of having excellent contrast in a wide viewing angle and excellent display quality.

Claims 2-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada in view of Yano et al as applied above, and further in view of Liu et al U.S. Patent Application Publication No. 2002/0089630.

Referring to claim 4, Yamada discloses the pixel electrode is formed in a slit structure, [see page 2, Detailed Description, paragraph 0021]. However, Yamada lacks of showing the benefit of having the slit structure formed on pixel electrode.

Liu et al teaches one or more openings (slits) are formed on an electrode layer in a pixel area to combine with fringe field effect for enhancing the multiple domains, [see page 1, Summary of the Invention, paragraph 0011] for the benefit of improving viewing angle.

Therefore, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use the pixel electrode, which is formed in slit structure, for the benefit of improving viewing angle.

Referring to claims 2-3, and 5, Yamada lacks of mentioning the “V”-shaped valley is provided to divide a unit pixel into at least two regions. Also, referring to claim 3, Yamada lacks of showing the “V”-shaped valley is provided to have the shape of “+”, “x”, or a cramp.

According to figure 6a – 6d, Liu et al shows the top views of some types of concave structure formed in a pixel area. There, it is obvious that the “V”-shaped valley divides a unit pixel into at least two regions. Further, Liu et al discloses many other top views such as an X, a Y-inverse-Y shape, a T-inverse-T shape, or a V-inverse-V shape also possible, [see page 2, Detailed Description, paragraph 31]. Providing the concave structure in each pixel area to form multiple domains for the benefit of improving viewing angle, reducing color dispersion, and reducing the number of fabrication process, [see page 1, Summary of the Invention, paragraph 0010].

Therefore, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have the concave structure dividing a unit pixel into at least two regions, to have the concave structure forms in many different shapes for the benefit of improving viewing angle, reducing color dispersion, and reducing the number of fabrication process.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Yamada U.S. Patent Application Publication No. 2002/0159012 discloses a vertically-alignment liquid crystal display having a color filter substrate with filled depressions for the benefit of improving response speed, higher contrast, better viewing angle characteristic for white display and black display.

Yano et al J.P. Patent No. JP02002090531 discloses the liquid crystal panel consists of the vertical alignment mode liquid crystal cell on the both sides of which the polarizing plates are arranged in the crossed Nicols with the transparent layers on the cell sides for the benefit of having excellent contrast in a wide viewing angle and excellent display quality.

Liu et al in U.S. Patent Application Publication No. 2002/0089630 discloses the liquid crystal panel having the concave structure, in many shapes, dividing a unit pixel into at least two regions, for the benefit of improving viewing angle, reducing color dispersion, and reducing the number of fabrication process.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to (Nancy) Thanh-Nhan P Nguyen whose telephone number is 571-272-1673. The examiner can normally be reached on M-F/9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on 571-272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

(Nancy) Thanh-Nhan P Nguyen
Examiner
Art Unit 2871



KENNETH PARKER
PRIMARY EXAMINER

TN